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DIOPHANTINE ANALYSIS.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

SOLUTION TO THE CELEBRATED INDETERMINATE EQUATION.

$$x^2 - Ny^2 = \pm 1.$$

By A. H. BELL, Hillsboro, Illinois.

[Continued from the March Number.]

No. 5. Example: Given $x^2 - 94y^2 = 1$. Required x and y .

This is the *most difficult number* under a 100. Proceeding in the usual way we have, No. Term

	1	2	3	4	5	6	
$m =$	2	+	1	+3	4	7	10
$n =$	10	+	10	+29	39	68	97
1st series of Diff.	+15	-6	-17	-18	-9	+10	
$D_1.$	-21	-11	-1	+9	+19		
$D_2.$	+10....						

+10 are nearly of a size.

$\left. \begin{array}{l} 3+10+13 \ 23 \\ 29+97+126 \ 223 \end{array} \right\}$

$\left. \begin{array}{l} +5-9-3 \\ D_1-14+6 \\ D_2+20 \end{array} \right\}$

We proceed with the two last convergents and commence a new series.

2nd series No.	Terms	3	4	5	6	7	8	
$m =$	19 + 13	36	59	82	105	128	151	giving $y = 221064$. $y^2 = 48869292096$
$n =$	97 + 126	349	572	795	1018	1241	1464	
Diff.	-9 + 10	+23	+30	+31	+26	+15	-2	
D_1	19, + 13,	+7	+1	-5	-11	-17		$x = 2.143,195.$
D_2	--6.....							$x = \frac{151 \times 94 \times 151 \times 1464}{1464} + 1.$

$$\text{Proof } \left\{ \begin{array}{l} 2143295^2 \\ 4593713457025 - 4593713457024 = 1 \end{array} \right. \quad 94 \times 221064^2 \quad x^2 = 4583713457025$$

These are the least values that can be found for x and y .

(TO BE CONTINUED.)

SOLUTIONS TO PROBLEMS.

3. Proposed by O. S. KIBLER, Superintendent of Schools, West Middleburg, Logan County, Ohio.

It is required to find three whole numbers in an arithmetical progression, such that the sum of every two of them shall be a square.

III Solution by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

Represent the required numbers by $\frac{1}{2}x^2 - (2x+1)$, $\frac{1}{2}x^2$, and $\frac{1}{2}x^2 +$